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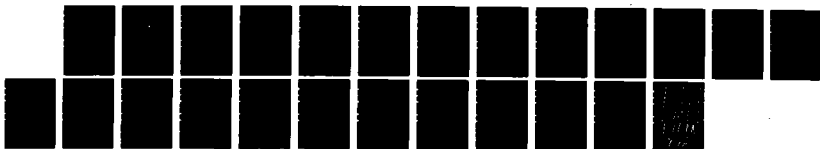
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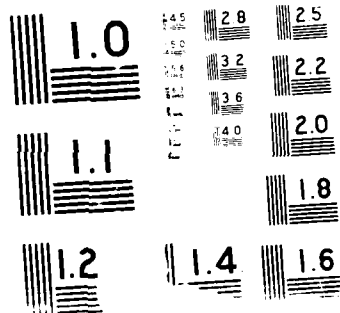
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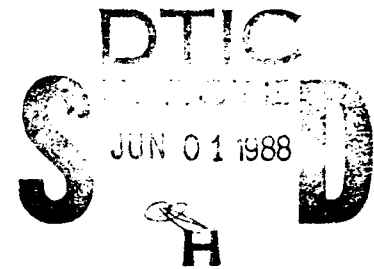
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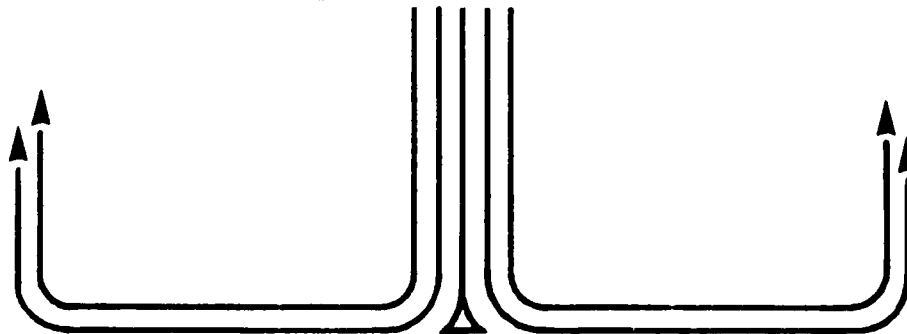
STUDENT REPORT

DETERRENCE: POTENTIAL FOR FAILURE

MAJOR ROBIN E. SCOTT

88-2360

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AUTHOR(S) MAJOR ROBIN E. SCOTT, USAF

FACULTY ADVISOR MAJOR JACK ROBBINS, ACSC/EDJ

SPONSOR MAJOR JACK ROBBINS, ACSC/EDJ

Submitted to the faculty in partial fulfillment of
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PREFACE

Those born since World War II have grown up under the ominous mushroom cloud of nuclear weapons. Having been exposed to the threat of nuclear annihilation all their lives, many of the post-war generation have adopted fatalistic attitudes about survival in a nuclear war. The premise that the world stands defenseless against these "ultimate" weapons is often accepted at face value. This same generation is now beginning to take the reins of power and must face the nuclear dilemma head-on. These future leaders must answer the question, "Can the strategy that has served the nation so well during this era of 'assured destruction' continue to protect the nation's security interests in the foreseeable future?"

The problem with deterrence is its "all or nothing" nature. Deterrence is designed only to maintain peace. Should the strategy fail, it offers no guidance for the prosecution of war. This paper attempts to highlight the fragility of deterrence by identifying certain real-world factors that could cause the strategy to crumble. Perhaps the one factor having the most potential to bring about such a failure is the never ending advance of science and technology. The same technology that made possible the atomic bomb and intercontinental missile now offers a possible defense against such weapons. Strategists and leaders must recognize the danger of continuing to rely on a strategy that is by no means foolproof. New alternatives for credible strategies must be considered today if the United States is to insure its security in the future.

This paper was written for the Nuclear Warfare Studies Branch at Air Command and Staff College as a primer on deterrence strategy. Portions of this monograph relied on research used in this author's Masters thesis, Prepared to Triumph: a Reevaluation of American Nuclear Strategy Objectives. Finally, as with any academic endeavor, the author claims sole responsibility for the accuracy, content, and format of this work.

ABOUT THE AUTHOR

Since his graduation from the USAF Academy in 1974, Major Scott has spent most of his time in the cockpit flying fighters. After completing Undergraduate Pilot Training at Craig AFB, Alabama, and F-4 conversion at Homestead AFB, Florida, Major Scott was assigned to the 52 Tactical Fighter Wing at Spangdahlem AB, West Germany, where he flew four years as an Instructor Pilot and Flight Examiner. In 1980, he was reassigned to PACAF and completed a remote tour at Kunsan AB, Korea. In 1982, Major Scott was selected to serve as a USAF Exchange Officer flying F-4Fs for the German Luftwaffe at GAF Pferdsfeld. He returned stateside in late 1983 to the 4450 Tactical Group at Nellis AFB, Nevada, where he flew A-7s and served as a unit Operations Officer. During this assignment, Major Scott completed a Masters Degree in Political Science with the University of Nevada, Las Vegas. His professional military education includes Squadron Officers School in residence (1979) and completion of the German language course at the Defense Language Institute in Monterey, California.

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EXECUTIVE SUMMARY

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REPORT NUMBER 88-2360

AUTHOR(S) MAJOR ROBIN E. SCOTT

TITLE DETERRENCE: POTENTIAL FOR FAILURE

I. Purpose: To examine the basic elements of deterrence theory and the impact of real-world factors on the continued success of this strategy.

II. Problem: Although deterrence has maintained the peace for more than forty years, there are a variety of factors almost always present in crisis situations that could cause the strategy to fail and plunge the nation into war. In addition, new advances in science and technology threaten to undermine the very foundation of this punishment-oriented strategy.

III. Data: Deterrence theory centers around two essential assumptions; accurate risks-versus-benefits calculations and logical rational decisions. An opponent considering attack must determine the defender's capability and will to carry out a deterrent threat and then make a rational decision based on his calculation. Unfortunately real-world factors often challenge the validity of these assumptions. During times of crisis, human emotions and biased perceptions often lead to less than rational actions. In addition, the actual capabilities of one's men and

machines on the battlefield can never be completely determined by tests and exercises. The "fog and friction" of war are variables that cannot be factored out of the deterrence equation. Finally, new advances in technology may soon challenge the basic premise of deterrence which is a threat to carry out strategic nuclear retaliation as punishment for any nuclear attack on American soil. This new technology may bring about the development of weapons that can once again be used to both deter and defend.

IV. Conclusions: Nuclear deterrence is by no means a foolproof strategy. History has proven the strategy can and does work. History has also shown no strategy works forever. The United States cannot continue to rely solely on a strategy that is designed only to maintain peace and offers no guidance other than retaliation in time of war.

V. Recommendations: Political and military leaders cannot be content to rest the security of the nation on deterrence strategy alone. New alternatives must be examined that offer both defensive and offensive options to the national decision makers. New strategies must be considered that can take advantage of technological breakthroughs to better defend and protect this nation and insure world peace.

DETERRENCE: POTENTIAL FOR FAILURE

On 6 August 1945 at exactly 8:15 a.m., the world was suddenly and violently thrust into the atomic age. That morning, a lone B-29 Superfortress released a crudely built atomic bomb over the Japanese city of Hiroshima and the crew watched as the weapon exploded with a force equal to nearly 20,000 tons of conventional TNT.¹ Eyewitnesses on the ground later recalled:

There was a pika, a blinding flash of pink, blue, red, or yellow light--none of the survivors ever agreed on the color--brighter than a thousand suns but coming from a fireball only 110 yards in diameter. In that split second the hypocenter or point of impact reached a heat of 300,000 degrees C. Within a thousand-yard radius granite buildings melted, steel and stone bridges burned and so did the river below them, roof tiles boiled, and people evaporated, leaving their shadows "photographed" like X-ray negatives on walls and pavement.²

Almost 100,000 people perished that day and within a year another 100,000 would die of severe burns and radiation poisoning.³ This awesome event marked the successful development of what many considered to be the ultimate engine of war, capable of destroying not just armies or cities but entire nations. A second atomic explosion over Nagasaki brought the war in the Pacific to a quick end and ushered in a new era of peace.

The dawn of the atomic age cast serious doubts on the future utility of war as an instrument of foreign policy. After all, men now possessed the ability to literally destroy the world. This new destructive potential meant that peace was no longer merely desirable but crucial for mankind's continued existence. American leaders and strategists agreed that nuclear war had to be avoided at all costs. To meet this objective, American leaders threatened to respond to any attack against the United States or its allies with swift and total atomic retaliation. This strategy of nuclear deterrence, born in the shadow of the first mushroom-shaped atomic cloud, today continues to be the driving force behind the development, deployment, and employment of American nuclear weapons systems.

At first glance, it appears as though nuclear deterrence has served the United States and its allies well for the past forty

years. Without question, this strategy has played a major role in the uninterrupted world peace since the end of World War II. It is important, however, to realize this deterrent threat does not come into play every hour of every day. As former Secretary of State James R. Schlesinger notes:

While we tend to talk of deterrence as though it were in continuous operation, it is doubtful if the leaders of the great nuclear powers ask themselves on a daily basis whether they feel deterred. It is only in circumstances of confrontation and crisis that the credibility of the deterrent comes under test.⁴

Only a handful of Soviets will probably ever know how often leaders in the Kremlin have seriously considered the use of nuclear weapons and backed down because of the deterrent threat.

Perhaps the most graphic case of nuclear deterrence in action occurred during the Cuban missile crisis of 1962. For two weeks the United States and Soviet Union played a deadly game of nuclear brinkmanship before the Soviets finally blinked. During this and other crises deterrence has worked, but is it safe to assume that this strategy will continue to guarantee peace in the foreseeable future? Sole reliance on nuclear deterrence ignores one harsh fact of reality; it might someday fail. And if it can fail, then the United States must look for alternatives today that can serve the nation's security needs in both peace and war.

This paper will attempt to analyze the weaknesses of deterrence by first defining the strategy in conceptual terms and then examining various real-world factors that adversely affect these theoretical assumptions. In addition, the destabilizing influence of technological advances on the continued effectiveness of deterrence will also be discussed. This methodical approach will hopefully provide an appreciation of the inherent weaknesses in deterrence strategy and offer an insight for future alternatives.

The first step in this analysis is to come up with a working model for deterrence theory. Patrick Morgan states:

'To deter' literally means to stop someone from doing something by frightening him. . . . Dissuasion by deterrence operates by frightening a state out of attacking, not because of the difficulty of launching an attack and carrying it home, but because the expected reaction of the opponent will result in one's own severe punishment.⁵

Deterrence is simply a threat to exact an unacceptable price from an opponent considering attack. This threat is the means (strategy) by which the defender hopes to dissuade his opponent from attacking (objective). Because deterrence is a defensive strategy which responds only to attack, it concedes the advantage of initiative to the aggressor. Ultimate success or failure rests not with the defender, who can only convey the threat, but with the opponent, who decides whether or not to attack. In theory, this decision consists of two simple factors; accurate assessments and logical rational actions.

The linchpin of deterrence theory is the risks-versus-benefits calculation. An opponent must ascertain whether or not the prospective benefits of an attack are worth the risks of retaliation. Are the prospective benefits significantly greater than the potential losses? Does the defender have the capability to carry out his threat? If so, does he also have the will to carry through with the threat, or is he only bluffing? Those familiar with the writings of Clausewitz will recognize the elements of capability and will. In his thesis On War, Clausewitz states that a nation's effort is equal to capability times will.⁶ In mathematical parlance, the deterrence equation can be written as:

$$\text{Effort} = \text{Capability} \times \text{Will}$$

wherein

$$\text{Effort}(\text{Defender}) \geq \text{Effort}(\text{Aggressor}) = \text{Peace}$$

and

$$\text{Effort}(\text{Defender}) < \text{Effort}(\text{Aggressor}) = \text{War}$$

If the defender's effort appears to be larger than what the aggressor wants or is able to exert, then the aggressor would honor the threat and peace is maintained. Conversely, if the aggressor feels he has the stronger effort and elects to ignore the threat, deterrence fails and war ensues. War determines whether or not the attacker's calculations were correct.

It is not enough, though, to simply plug in numbers and come up with an answer. Assuming a defender does indeed have the necessary effort to stop an attack, the aggressor must accurately calculate this condition and make the rational choice not to attack if deterrence is to succeed. These simple requirements for accuracy and logical actions are often missing in real-world situations. As Morgan points out:

Deterrence theory takes threat and reaction, a complex psychological phenomenon with obvious roots in the emotional equipment of man, and reduces it to the interaction of a set of rational decision makers.⁷

Errors and irrational behavior, intentional or otherwise, could have disastrous results on deterrence.

One flaw with deterrence theory is its assumption that players will always act in a rational and logical manner. One strategist describes deterrence theory as "psychologically illiterate"⁸ because it fails to take into account the role human emotions play in the decision making process. History is replete with examples of leaders who failed to act rationally, particularly in times of crisis. In stressful situations, decisions can become influenced by fear, anger, and mistrust.

The danger a madman with nuclear weapons poses to deterrence is easy to comprehend, but men do not have to be insane to strain the strategy's effectiveness. As former Commander of SAC, Gen. Russell Dougherty, stated: "Deterrence has to work when the other person is mad or provoked--not insane, but provoked and bent on your destruction."⁹ As previously mentioned, deterrence comes into play during times of crisis. Unfortunately, such situations are also fertile ground for strong emotions to develop. The assumption that men will always act rationally is but one weak link in this strategy.

Another weakness of deterrence theory is the assumption that both elements of the equation, capability and will, can always be accurately calculated. Not even the accurate assessment of one's own capabilities can be considered a given in the real-world environment. Postulated capabilities based on test results often differ dramatically from actual performance on the battlefield. Donald M. Snow, in his book The Nuclear Future: Toward a Strategy of Uncertainty, emphasizes no amount of weapons testing can ever simulate all the variables of a wartime environment.¹⁰ Such uncertainties are part of the "fog and friction"¹¹ of war and cannot be factored into the deterrence equation.

Difficulties in the accurate calculation of one's own capabilities are minor compared to accessing the capabilities of an unwilling opponent. Nations jealously guard such military secrets from any outside collection efforts. Technology has produced very sophisticated reconnaissance and surveillance systems, but even these modern tools of espionage are susceptible to disguise, deception, and misinterpretation.¹² If the success or failure of deterrence depends on the accurate assessment of

capabilities on both sides of the equation, then these real-world uncertainties severely weaken the strategy's credibility.

The deterrence equation also assumes an accurate assessment of a defender's will. While capability estimates are normally based on hard intelligence data, the strength of an opponent's will can only be based on his words and actions. Quite often, ethnic and historical biases tend to cloud a decision maker's perceptions.¹³ Henry Kissinger took into account any possible miscalculations based on faulty perceptions by rewriting the deterrence equation as:

$$\text{Deterrence} = \text{Power} \times \text{Will} \times \text{Opponent's Perception}^{14}$$

If the defender can, in fact, mount a larger effort it becomes especially critical for the aggressor to have an accurate perception of the defender's will. Any underestimations on his part might tempt him into a war that, in reality, is not to his advantage. Conversely, overestimation of a defender's will can serve to promote deterrence by making the defender's effort seem larger than it really is (which may be just enough to dissuade the aggressor from attacking). In short, both elements in the deterrence equation are influenced by real-world factors that can introduce errors in the calculation. These factors could someday cause the strategy to fail.

Before the atomic age, when deterrence failed, the weapons used to deter war were also used for defense. The unique characteristics of these new weapons, though, put a whole new perspective on the deterrence equation. Their destructive potential was so enormous that other all other factors seemed irrelevant. Byers concludes the days of using weapons to both deter and defend vanished with the first atomic bombs because there was no viable defense against large scale nuclear attack.¹⁵ War was no longer a zero-sum game with winners and losers--now there would only be losers.

As the number of atomic weapons grew, strategists and military leaders struggled to find a use for them. Many were convinced there was no military use for these weapons. Former Secretary of State McNamara once stated:

. . . I do not believe we can avoid serious and unacceptable risks of nuclear war until we recognize. . . that nuclear weapons serve no military purpose whatsoever. They are totally useless--except only to deter one's opponent from using them.¹⁶

Deterrence became the strategy of choice; there seemed to be no other alternatives. The use of atomic weapons as an instrument of violence had found little if any appeal.

In the early years of the atomic age, Americans felt secure with their nuclear monopoly. After WW II, President Truman used this advantage to extend the protection of the nuclear umbrella over the West European allies. The explosion of a Soviet nuclear device on 1 August 1949 ended the monopoly, but the United States continued to rely on its large stockpile of atomic bombs and superior force of SAC long-range bombers to enforce the retaliatory threat. As Carl H. Builder points out:

The 1950's concept of 'Massive Retaliation'--the threat of a massive nuclear response to a conventional aggression by the Communists--was a contradiction in terms. It might better have been called a 'massive response'.¹⁷

American leaders and strategists knew the Soviets would strive to close the atomic gap as soon as possible. There were even discussions in various circles as to the pros and cons of launching a preventive strike against the Soviet Union while the United States still enjoyed overwhelming superiority.¹⁸ But by 1956 Soviet stockpiles had reached sufficient levels to seriously threaten the United States and ideas of a "balance of terror" started to take root in nuclear policy formulation.¹⁹ With each side holding the other's cities hostage to nuclear attack, the terror of Armageddon began to create a stable, albeit frightening stalemate. This stability was soon upset by another technology breakthrough--the intercontinental missile.

The Soviet launching of a Sputnik satellite on 4 October 1957 ushered in the missile age. These new missiles threatened the strategic bomber force which was the backbone of the American deterrent threat. The short flight time of ICBMs meant that any bombers not airborne or ready for immediate launch would be caught on the ground and destroyed. Now it was American scientists who rushed to close the technology gap and restore the fragile "balance of terror". By the late sixties, both sides had developed sufficient numbers of ICBM's with supporting early warning and control systems to restore a semblance of stability.

This new stability gave rise to a new doctrine of Mutual Assured Destruction or MAD. Then Secretary of Defense Robert S. McNamara saw MAD as a way to quantify the strategic forces necessary for maintaining a credible deterrent threat. Edward Luttwak comments:

By working back from the goal of 'unacceptable damage' it seemed as if one could define a whole strategy by simple arithmetic. In order to kill X million Russians living in Y cities, one needed Z nuclear weapons of a certain 'yield' (i.e. explosive energy).²⁰

This "minimalist" school of thought considered the deployment of any nuclear weapons above those required to inflict "unacceptable damage" to be of marginal value. Additional weapons would only destabilize the balance of terror and touch off another arms race.²¹ Unfortunately, much to the chagrin of MAD advocates, the Soviets disregarded the precepts of MAD.

The MAD theorists insisted that the Russians would now stop adding more weapons since **their** theory 'proved' that additional weapons would merely be useless, given that the Russians now had enough for mutual assured destruction. But their Russian pupils proved to be strangely obdurate on this small theoretical point, and went on adding more and more ICBM's.²²

As Soviet strategic forces continued to grow through the sixties and into the seventies, the United States continued to rely on the strategic triad's ability to survive a first-strike with sufficient forces remaining to inflict 'unacceptable damage'. All too soon deterrence was once again threatened by technological progress.

New technology breakthroughs came in the form of Multiple Independently Targetable Reentry Vehicles (MIRVs) and advanced navigation systems that greatly improved warhead accuracies. These systems paved the way for the development of ICBMs with a true counterforce capability. The introduction of such weapons in the Soviet inventory again threatened America's retaliatory strategy as ground based forces became vulnerable to a Soviet nuclear first-strike. For example, the Soviet SS-18 ICBM, capable of carrying at least 10 MIRVs with a delivery accuracy of .2 to .25 nautical miles²³, was viewed by many defense analysts as a severe threat to the silo-based Minuteman and Titan systems. This period became known as the "window of vulnerability", which the United States is trying to close with the deployment of counterforce capable systems like Peacekeeper. Of course, the prospects of new and dramatic technology breakthroughs just on the horizon already threaten to upend any future stability.

Publications today are filled with debate and comment on President Reagan's Strategic Defense Initiative and its possible repercussions on deterrence. The issues surrounding SDI are too varied and complex to be adequately addressed here. Nor is it

within the scope of this paper to argue the technical feasibility of such a system. However, assuming that the scientific community can field SDI, it is possible to discuss some of the consequences such a system would have on deterrence.

Like earlier technology advances, an effective Ballistic Missile Defense (BMD) system could seriously threaten the effectiveness of the deterrent threat. Whereas previous advances refined and enhanced retaliatory forces, a BMD would actually undermine the punishment-oriented strategy. Since the introduction of nuclear weapons, members of the nuclear club have relied on the threat of large scale retaliation to insure peace. An effective BMD system would provide the opportunity to break loose from this "surrender or suicide" dilemma and give national leaders precious time to consider an appropriate response. With a BMD, weapons could once again be used both to deter in peace and defend in war. More importantly, a BMD system does not have to be tied to a purely defensive strategy. It is the capability of a BMD to also support offensive strategies that scares deterrence advocates the most.

A nation with a BMD monopoly stands to gain enormous military leverage. Such a monopoly would neutralize an opponent's nuclear retaliatory forces and render any deterrent threat useless. This capability might tempt leaders to adopt a "massive retaliation" type strategy where they could threaten to respond to any type of aggression (or even initiate an attack, if they so desired) at the time and place of their choosing.

The side without BMD, on the other hand, would be faced with some very unattractive options. Forced to accept a drastic change in the balance of power, the "have-not" would be constantly vulnerable to political and military blackmail. This situation would certainly be a bitter pill for any superpower to swallow. Even declared policies of non-aggression by the other side would be little comfort to the side that had to do without. Such a scenario epitomizes the nuclear deterrence dilemma. While it is certainly in the interests of both superpowers to establish a stable strategic balance, it is also dangerous for one side to unilaterally forgo the types of research that may one day break the nuclear stalemate.

Nuclear deterrence, by its very nature, is a fragile strategy for maintaining world peace. Real-world factors such as human emotions, inaccurate intelligence, and erroneous perceptions are all capable of producing gross errors in the deterrence calculation. Even though the destructive potential of nuclear weapons presently makes the use of violence a "no win" option, technological breakthroughs may someday soon make war once again

a zero-sum game with losers and winners. The lure of new technologies will continue to spur nations in pursuit of a decisive edge.

The United States can no longer be content to rely solely on a punishment-oriented retaliation strategy. Keith Payne and Colin S. Gray conclude:

The central problem of nuclear deterrence is that no offensive deterrent, no matter how fearsome, is likely to work forever, and the consequences of its failure would be intolerable for civilization.²⁴

Understanding the inherent weaknesses of nuclear deterrence in an imperfect world highlights the need to continue searching for sound offensive and defensive strategies that can take quick advantage of newly emerging technologies. Failure to follow such a course of action may someday change the balance of power and threaten the basic security of this nation.

ENDNOTES

¹These MARK 3 "Fat Man" atomic bombs weighed approximately 10,000 pounds and used an implosion technique on a core of nuclear material to create a fission reaction. David A. Rosenberg, The Origins of Overkill: Nuclear Weapons and American Strategy, 1945-1960 in Steven E. Miller, ed., Strategy and Nuclear Deterrence, (Princeton: Princeton University Press, 1984), pp. 124,134.

²Faubion Bowers, "The Bomb and Hiroshima," in David Wallechinsky and Irving Wallace, eds., The People's Almanac, (Garden City, New York: Doubleday and Co., 1975), p. 508.

³Ibid.

⁴James R. Schlesinger, Annual Defense Department Report, FY 1976, (Washington, D.C.: U.S. Govt Printing Office, February 1975), p. II-1.

⁵Patrick M. Morgan, Deterrence: A Conceptual Analysis, (Beverly Hills: Sage Publications, 1977), p. 20.

⁶Michael Howard and Peter Paret, eds., Carl von Clausewitz On War, (Princeton: Princeton University Press, 1976), p. 77.

⁷Morgan, A Conceptual Analysis, p. 15.

⁸Janice Gross Stein, "Deterrence in the 1980s: A Political and Contextual Analysis," in R.B. Byers, ed., Deterrence in the 1980's, (New York: St. Martin's Press, 1985), p. 49.

⁹General Russell Dougherty, as quoted in John T. Cornell, "How the Ducks Line Up", Air Force Magazine, (June 1968):73.

¹⁰Donald M. Snow, The Nuclear Future: Toward a Strategy of Uncertainty, (University of Ala.: The University of Alabama Press, 1983), p. 140.

¹¹Howard, On War, pp. 84-85, 119-21, passim.

¹²Richard Betts discusses both the capabilities and limitations of intelligence operations throughout his work. Such factors as enemy deception, inaccurate or incomplete data, misinterpretation, and failure to comprehend or believe available information often lead to a less than accurate assessment of enemy capabilities and intentions. See Richard K. Betts, Surprise Attack, (Washington D.C.: The Brookings Institution, 1982).

¹³Benjamin Lambeth, for example, criticizes MAD theorists for perceptions that are, "... dominated by a common ethno-centric bias that projects Western strategic premises and practices onto Soviet military planning and assumes that whatever is logical or preferable for U.S. military theoreticians must also be acceptable to Soviet political-military leaders." Benjamin S. Lambeth, Selective Nuclear Options in American and Soviet Strategic Policy, (Santa Monica, Calif.: Rand Corp., R-2034-DDRE, December 1976), p. 3.

¹⁴Henry Kissinger, The Necessity for Choice: Prospects of American Foreign Policy, (New York: Harper & Brothers, 1961), p. 12.

¹⁵Byers, Deterrence in the 1980's, p. 16.

¹⁶Robert S. McNamara, "The Military Role of Nuclear Weapons: Perceptions and Misperceptions," Council on Foreign Relations 61 (Summer 1983):79.

¹⁷Carl H. Builder, A Conceptual Framework for a National Strategy on Nuclear Arms, (Santa Monica, Calif.: Rand Corp., R-2598-AF, 1980), p. 8.

¹⁸Bernard Brodie, Strategy in the Missile Age, (Princeton: Princeton University Press, 1959), pp. 227-8.

¹⁹Peter Paret ed., Makers of Modern Strategy From Machiavelli to the Nuclear Age, (Princeton University Press, 1986), p. 744.

²⁰Edward N. Luttwak, Strategy and Politics, (New Brunswick: Transaction Books, 1980), p. 40.

²¹For a discussion of minimalist/maximalist schools of thought and their impact on strategic force structure, see Y. Harkabi, Nuclear War and Nuclear Peace, (Jerusalem: Israel Program for Scientific Translation, 1966), pp. 52-65.

²²Luttwak, Strategy and Politics, p. 44.

²³For a comparative analysis of various Soviet and American nuclear systems, see Colin S. Gray, "The Future of Land-Based Missile Forces," in Christoph Bertram, ed., Strategic Deterrence in a Changing Environment, (Mont Clair, N.J.: Allenheld, Osum & Co., 1981), pp. 95-98.

²⁴Keith B. Payne and Colin S. Gray, "Nuclear Policy and the Defensive Transition," Council on Foreign Relations, 62 (Spring 1984):820.

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